

Comparing Crop Consumptive Use Estimates in the Sacramento San Joaquin Delta

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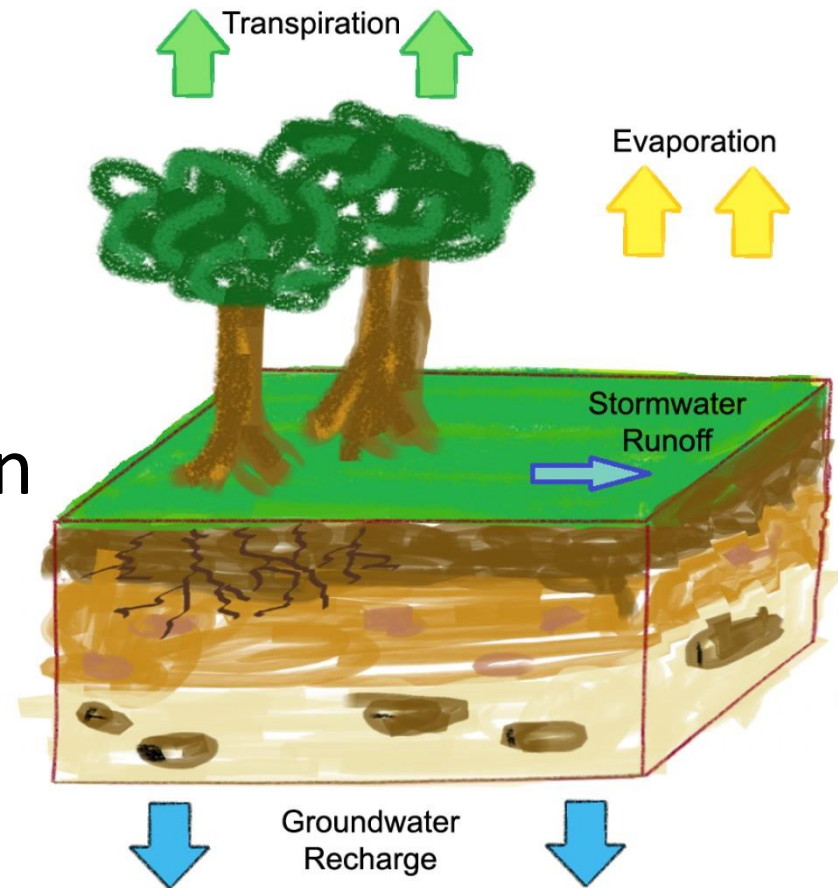
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November 21, 2013

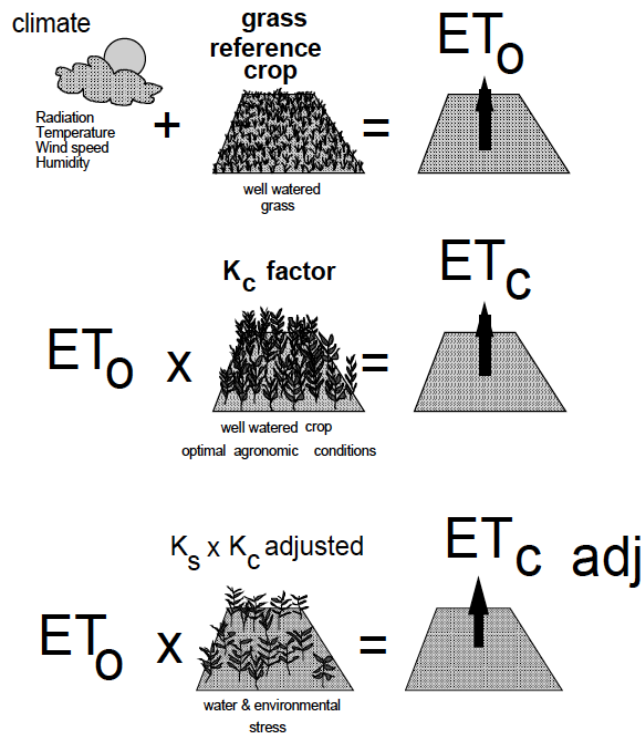
Consumptive Use and Crop Evapotranspiration

- Consumptive use is the water removed without returning for use downstream.
- Mostly, crop transpiration + soil evaporation = Evapotranspiration

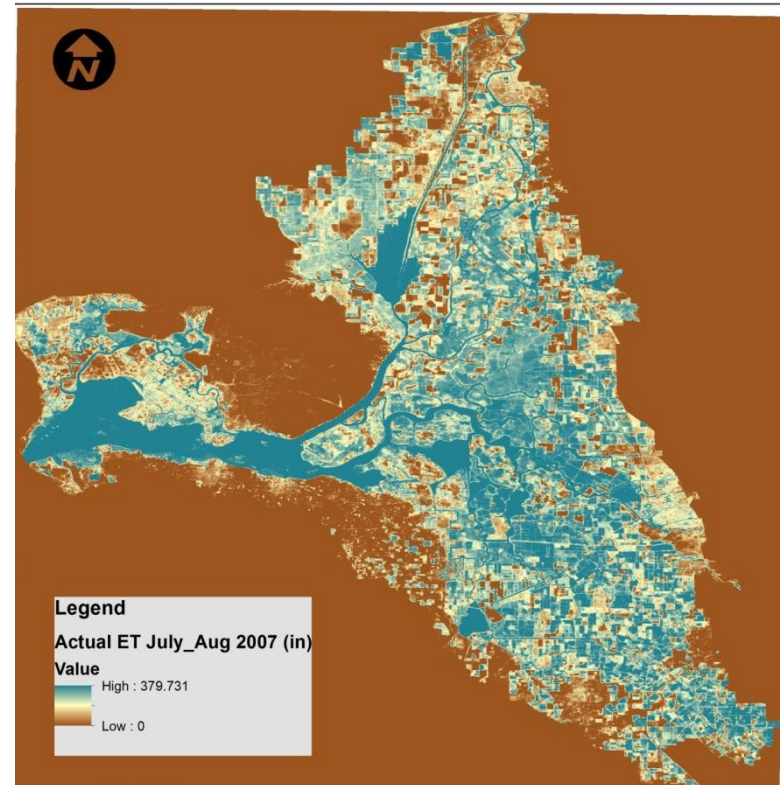


Methods

- Crop coefficients and reference evapotranspiration

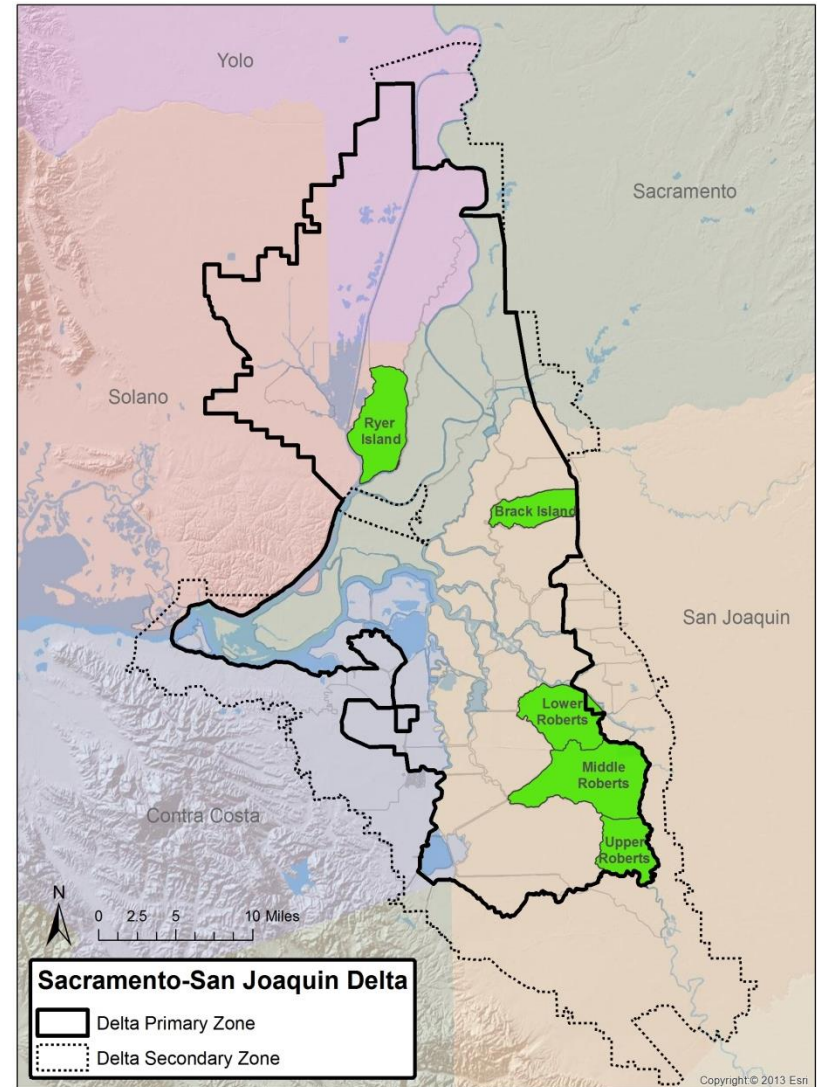


- Energy balance methods like SEBAL

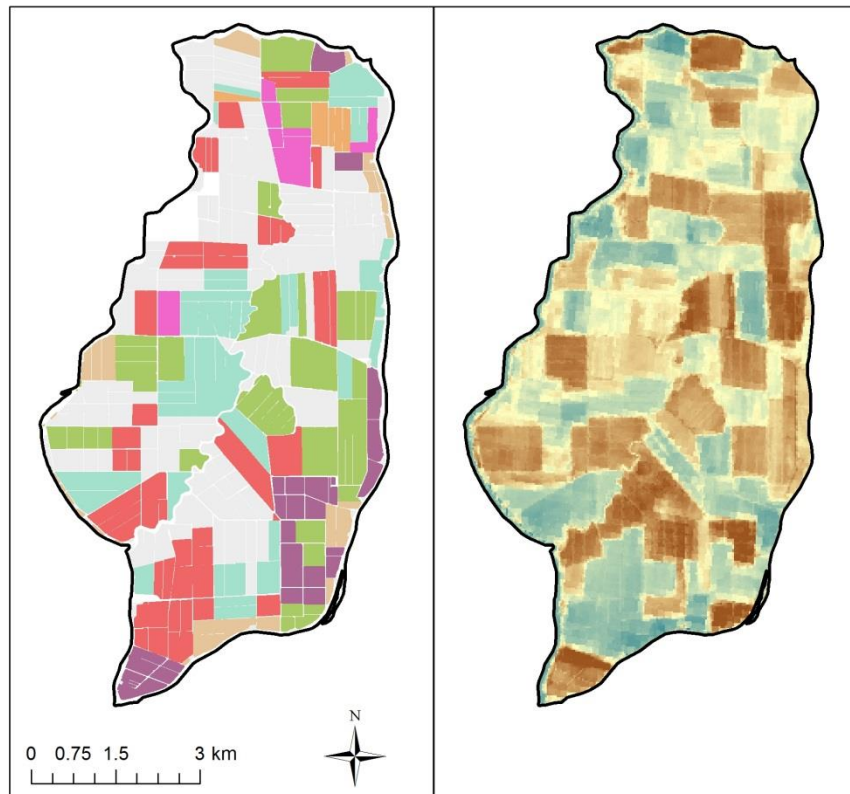


Compared three methods

- ITRC- Spreadsheet approach
- CalSIMETAW (DWR)
- SEBAL
- Five islands
- 2007 land use



Ryer Island

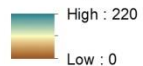


Land use



Period Actual ET (mm)

July 16th to July 31st, 2007

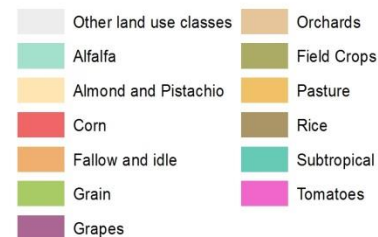


Data sources:07_Delta_SM_ver3,SEBAL 7.21.07 ETA_per

Upper Roberts Island

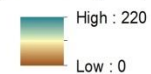


Land use



Period Actual ET (mm)

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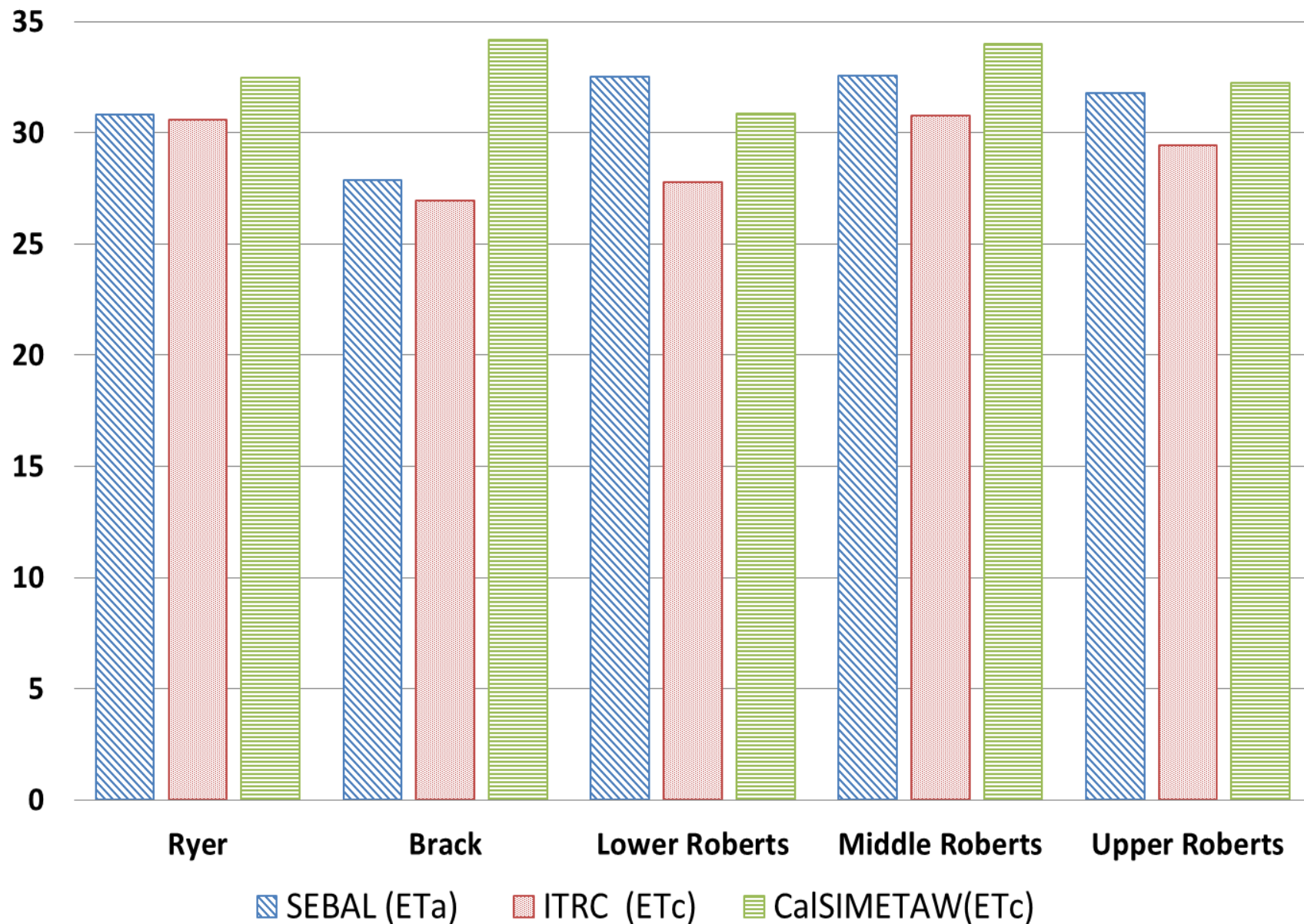


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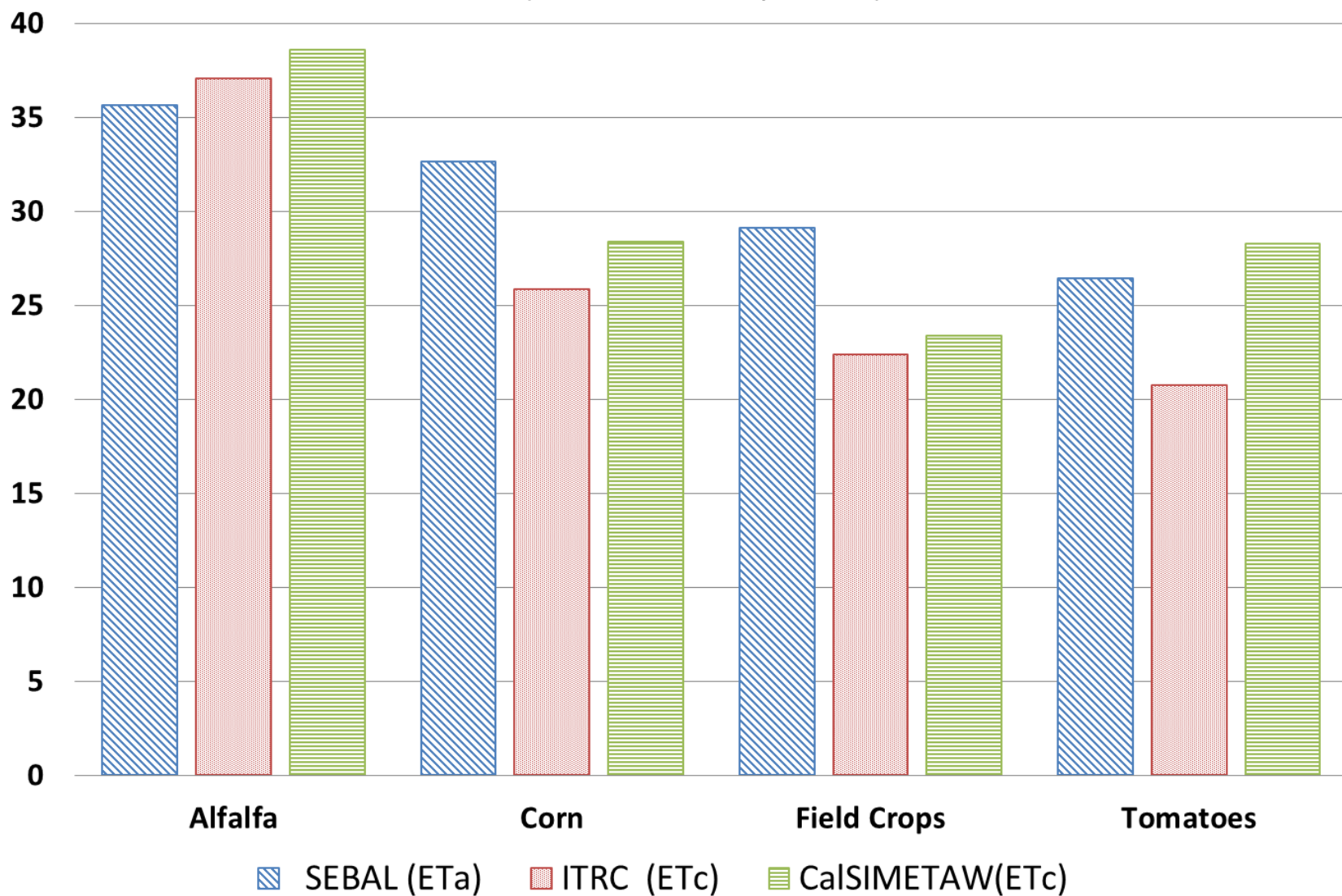
Comparison of three methods

Crop Group	SEBAL (ETa, in)	ITRC (ETc, in)	CalSIMETA W (ETc, in)
Alfalfa	35.64	37.06	38.57
Corn	32.62	25.86	28.37
Field Crops	29.10	22.37	23.36
Grain	24.46	12.31	23.65
Orchards	34.30	33.17	38.21
Pasture	33.10	37.96	44.83
Tomatoes	26.42	20.77	28.27
Vine (Grapes)	19.83	24.85	32.02

Major Crops Seasonal Evapotranspiration (inches, March-September)

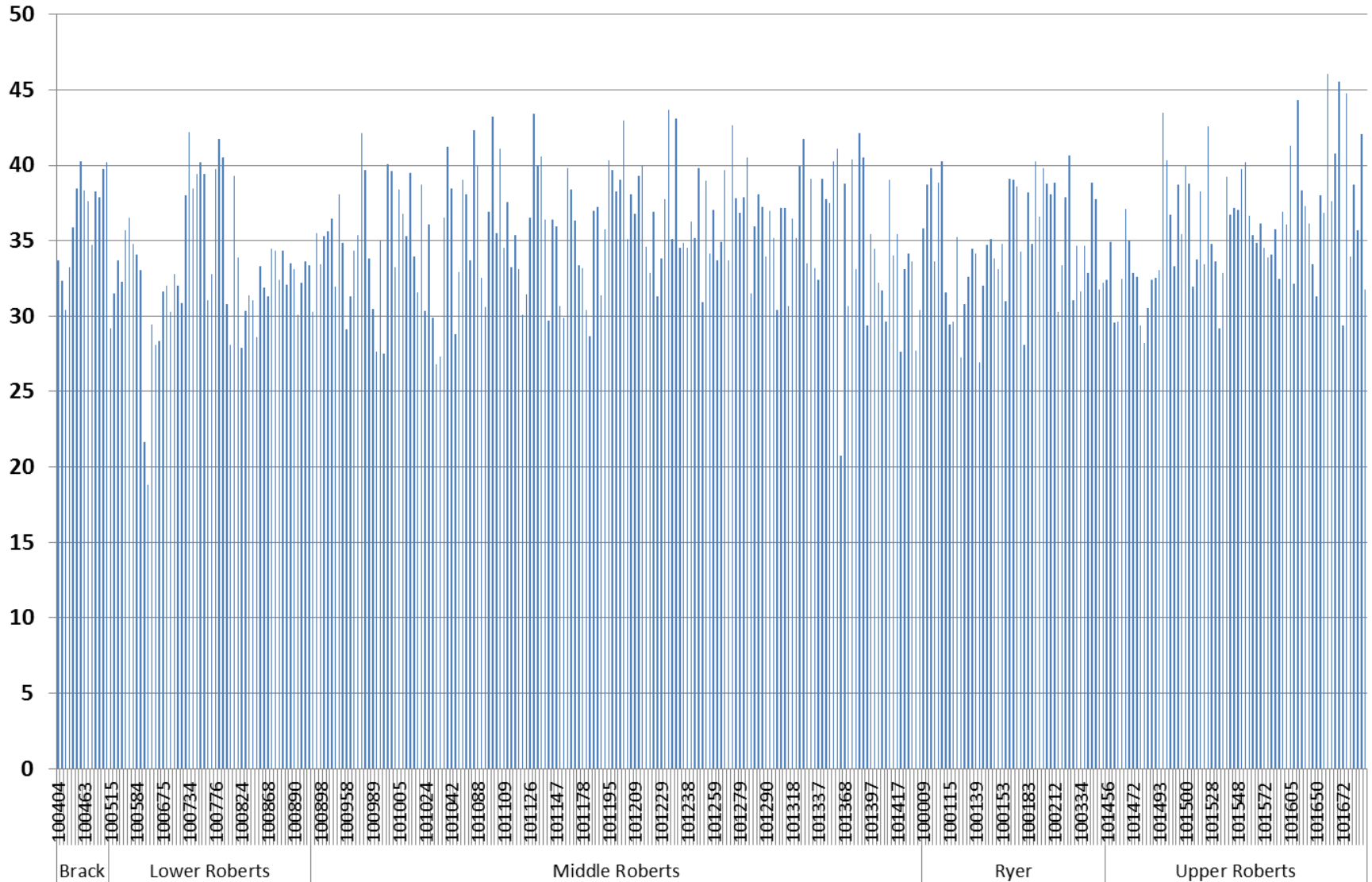


Seasonal Evapotranspiration
(inches, March-September)

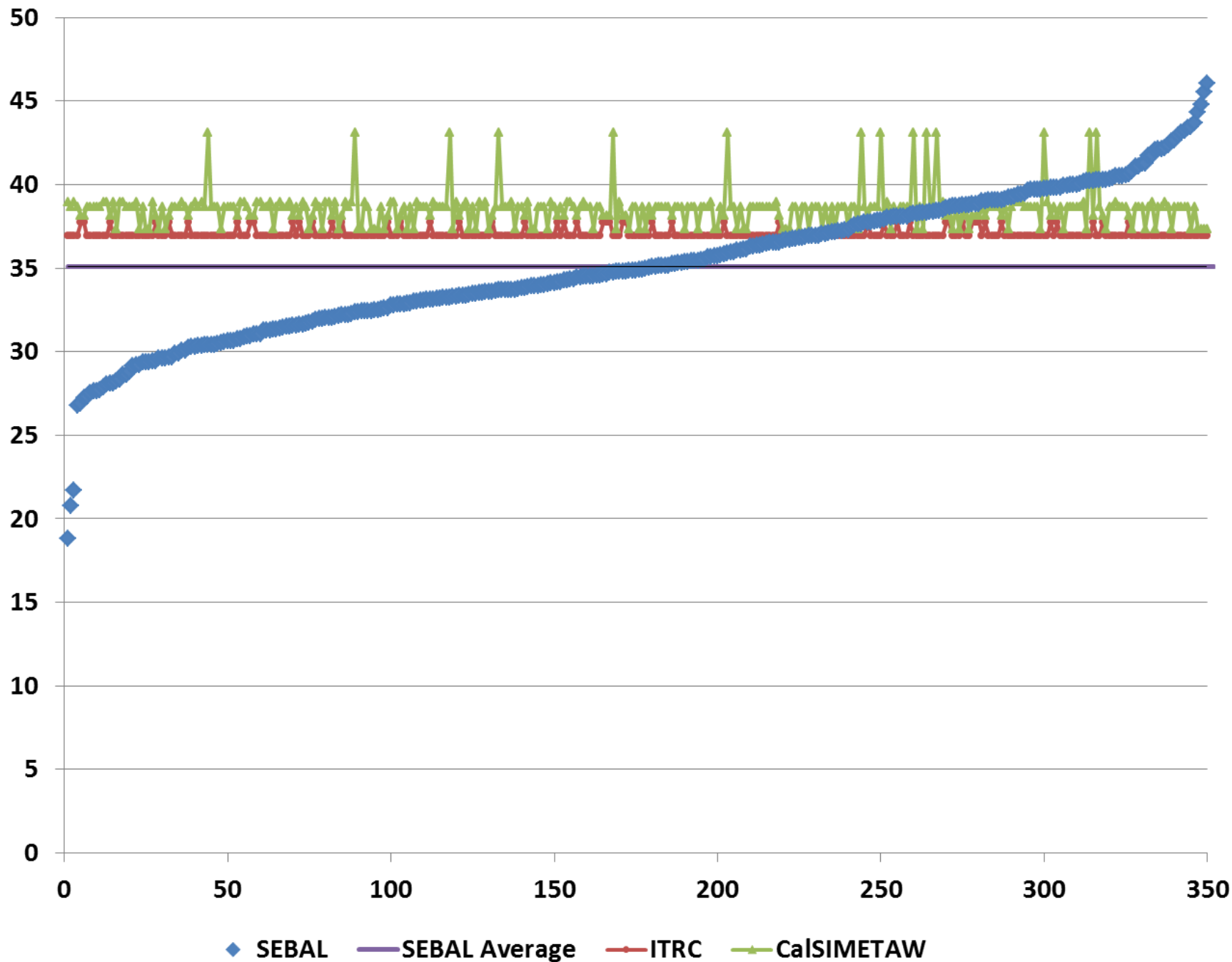


Average Seasonal Evapotranspiration by Field

(March to September, inches)



Seasonal Evapotranspiration (March-September, inches)



Conclusions

- All three ET methods are close for major crops
- The remote sensing method (SEBAL):
 - Provides reliable estimates of crop ET
 - Captures stress, irrigation uniformity and other conditions by field
 - Acquires data non-intrusively and consistently
- Comparisons with DETAW and expansion to other Delta areas could be beneficial
- An inter-agency data program involving remote sensing methods could be beneficial